Predicting and Preventing Child Maltreatment:
A Bio-Cognitive Transactional Approach

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In this chapter, I consider the pathology-amplifying transactional processes that involve (1) adults who interpret caregiving challenges as threats, and who respond to such threats with “defensive” reactions, and (2) children who are exceptionally reactive to their social environment. Within this dyadic combination, the responses shown by one member foster increased stress and maladaptive coping responses in the other member (see Fig. 1). This process reflects a bio-cognitive transactional system that may serve to foster mal- or mistreatment within parent-child relationships – and may even lead to perpetuation of such interactions across generations (e.g., Francis, Diorio, Liu, & Meaney, 1999; Maestripieri, 2005).

We also consider the utility of intervention processes early in life that may prevent or attenuate the mistreatment or maltreatment of young children that often follows from combined parent and child risk features. A transactional approach can be employed not only to explain or predict child maltreatment, but also as a conceptual framework for remediation.

Background of the Question

Early approaches to child maltreatment -- at both a theoretical level and a popular level -- accounted for such processes with simple linear models. Psychologists typically located causality within parental psychopathology as it was believed that only parents with some type of mental illness would engage in such behavior. Sociologists, on the other hand, were more likely to propose a linear model in which causality resided within stressors and problems that occur in society. Those parents who themselves were more likely to engage in harsh or abusive practices often located the source of problems within the misdeeds and provocations of the children themselves. Reactions across time and within different cultures also varied. For example,
infanticide -- in traditional societies -- is often viewed as appropriate when such children were seen as “evil” or as hopeless flawed (see Bugental, 2003, for a review of cultural differences). So the story begins with competing -- but consistently linear -- accounts of the causes of child maltreatment.

My own interest in this topic emerged at a time when psychologists were first questioning linear accounts of maltreatment -- or indeed linear accounts of parenting and socialization processes in general. As a social psychologist, I was employed in a post-doctoral position with the mission of exploring the communication processes that occur in dysfunctional (and often abusive) families in comparison with typical families. My training led me to focus on the kinds of attributions that parents in dysfunctional families were making about their children. Not only were parents blaming children for their negative experiences at school and at home, they were also blaming children for the problems created for them as parents. In short, such parents appeared to think of themselves as victims of their children. At the same time, the children themselves -- even from the perspective of an objective observer -- could best be described as “difficult,” “odd,” or “hard to handle.” Although we found systematic differences in the communication style of dysfunctional versus typical families, these observations did not consider the dynamic source of these differences. These findings (and anecdotal observations) did, however, serve as a motivation to explore the current state of theory and knowledge on this topic.

**Emerging Models of Child Maltreatment**

In exploring past accounts of poorly functioning or maltreating families, it was easy to see the focus on the characteristics and effects of parents (Spinetta & Rigler, 1972: Steele & Pollack, 1968). This approach was consistent with the then prevailing “parent effects” model. However, there was also emerging evidence that child characteristics influenced their risk for
maltreatment (e.g., Elmer & Gregg, 1967; de Lissovoy, 1980; Sherrod, O’Connor, Vietze, & Altemeier, 1984), consistent with the general challenge offered by Bell (1968) to “parent effects” models.

Transactional approaches – at the most general level – were introduced as concerned with the reciprocal influences between parents and offspring, that is, the changing processes that occur over time within dyadic (or family) relationships (as originally proposed by Sameroff, 1975; Sameroff & Chandler, 1975 -- and as reviewed later by Sameroff & Mackenzie, 2003). The notion of reciprocal influences within maltreating relationships was subsequently reflected in the social-contextual model of parenting described by Belsky (1984).

When attention was directed to pathological processes, attention was also given to the particular dyadic combinations that promote or attenuate psychopathology. This basic idea was a component of Thomas, Chess and Birch’s focus (1968) on the “match” (or mismatch) between parents and children. These investigators suggested that children with a “difficult” temperament would show quite different outcomes based upon the ways in which parents responded to these child characteristics. Relevant to pathological processes, negative outcomes were predicted when parents were negatively reactive to a child’s temperament pattern. When focused on developmental psychopathology, transactional models were extended to conceptualize such outcomes as residing in the adaptiveness (or maladaptiveness) of the relationship between individual and context (Sameroff & Emde, 1989).

**Development of Cognitive Model of Child Maltreatment**

Following my training in social cognition, early attention in our lab turned to the explanatory processes that appeared to foster negative reactivity to certain kinds of children, that is children who *might* be construed as resistant or unresponsive. Social cognition theory drew
attention to the fact that people are more likely to rely on their pre-existing beliefs and schemas when faced with an ambiguous situation -- in particular one that posed a potential problem or challenge (Wong & Weiner, 1981).

The early observations within this program of research (conducted by Bugental and her colleagues) drew attention to (1) the distinctive features of children who were at greater risk for harsh or abusive parenting, along with (2) the apparent explanatory biases of their parents. The families studied had been referred to clinical settings (as a result of the problems experienced by parents in coping with difficult caregiving experiences, Bugental, Blue & Cruzcosa, 1989; Bugental, Blue, & Lewis, 1990).

The children who were more likely to be identified as “difficult” (by both parents and objective observers), and who were the recipients of harsher or more abusive parenting, showed different behavioral patterns than did their “easier” (and less harshly-treated) siblings (Bugental et al., 1990). For example, they were less socially responsive to the initiations of either their own mothers or those of an unrelated woman. In addition, they demonstrated a variety of patterns that were interpreted by judges (blind to their history) as “inappropriate” or “atypical” (e.g., stereotypical movements). These children were also more likely to be reported by their mothers as born prematurely (or as having experienced birth complications) -- an anecdotal account that we followed up later with a systematic prospective analysis.

A comparison was also made of the caregiving attributions made by parents who were abusive or non-abusive with their children (within a clinical sample that shared the history of experiencing difficulty in caregiving relationship but that differed in their parenting tactics) (Bugental et al., 1989). Parents who made use of harsh or abusive tactics were more likely than other parents to explain problematic interactions with children as due to factors that the child
could control (e.g., the child being stubborn), or to factors that the adult could not control (e.g., the adult being sick). Harsher parents were more likely to characterize themselves as experiencing a low “balance of power” in the relationship; that is, they saw the child as having more control over relationship outcomes than did the caregiver. *Unrelated* mothers with a low perceived balance of power were more likely to respond to the “difficult” child (i.e., the child more likely to receive harsh parenting at home) with more annoyance or irritation than they did to the “easier” child (i.e., a sibling who was less likely to receive harsh parenting at home). In addition, unrelated mothers with low perceived power responded to the more difficult child with increasing expression of negative affect over the course of the interaction (Bugental et al., 1990).

Although these early findings revealed the potential importance of parental power perception, there were limitations in the conclusions that could be drawn. For example, no information was available regarding the specific features of children that served to elicit more negative affect from unrelated women with low perceived power. In addition, the correlation between the attribution biases of mothers and the characteristics of their children allowed no secure causal inferences, in that the direction of effects was unclear. There was also the possibility that effects could be accounted for shared genetic influences. With this in mind, we shifted to an experimental approach in testing the suggested transactional relationship.

**Experimental Test of Transactional Model**

*Adult Cognitions as Moderators of Their Reactions to Children*

A series of investigations was conducted that allowed the possibility of drawing causal inferences in the relationships that emerge between adults and children. The research strategy involved observations of the interaction between adults who differed in their caregiving perceptions, and unrelated children who differed systematically in the potential challenge or
threat they posed. We proposed that the beliefs or interpretive biases that adults bring to the relationship constitute a central moderator variable in the responses shown to “difficult” children (Bugental & Shemnum, 1984; Bugental, 1992). The settings and tasks employed were relatively ambiguous in nature – a context that is more likely to lead adults to rely on their pre-existing interpretive biases.

Adult participants were selected on the basis of their power perceptions (as measured by the Parent Attribution Test, Bugental et al., 1989). One line of research within this program explored the dynamic functioning of these power schemas. Parents with “low power schemas” manifested exceptionally easy access to power ideation (Bugental, Lyon, Cortez, & Krantz, 1997). Their decisions about power-relevant information were made just as quickly in the presence or the absence of a cognitive load. In contrast, other parents, when making power-relevant decisions, showed a slowed response. The short response latency shown by “low power” parents in the presence of a cognitive load suggests the implicit or automatic nature of their interpretations of power-relevant information. As an indication of the conflict they experienced, they rated themselves as more dominant in the absence of a cognitive load (a condition that allows the operation of more deliberative, controlled judgments) but rated their child as more dominant in the presence of a cognitive load (a condition that serves to elicit easily-accessed automatic responses). This suggests a combination of a strong motivation to maintain control (in the caregiving relationship) but a questioning of their ability to do so. Any situation that poses a potential power threat also appears to interfere with effortful thought for such individuals. For example, they have more difficulty recalling their thoughts after interacting with a child who posed a potential power threat (Bugental, Brown & Reiss, 1996).
Within this line of research, the adult participants included both parents and non-parents (with no differences found between groupings), and both and males and females (with findings generally stronger for females). The tasks involved either (1) a game format in which the adults served as an “instructor” (Bugental, Caporael, & Shennum; 1981; Bugental, Blue, Cortez, Fleck, Kopeikin, Lewis, & Lyon, 1993; Lewis, Bugental & Fleck, 1991; Bugental, Lewis, Lin, Lyon, & Kopeikin, 1999), (2) an unstructured conversation in which the adult was directed to take the lead (Bugental & Shennum, 1984), (3) a situation in which the adult simply viewed (or heard) the child they expected to interact with or instruct (Bugental & Cortez, 1988; Lin, Bugental, Turek, Martorell, & Olster, 2002), or (4) priming for thoughts about a “difficult” child (Bugental, Brown, & Reiss, 1996).

Child characteristics were either selected (e.g., Bugental et al., 1981; Lin et al., 2002) or systematically varied (e.g., Bugental, Blue, Cortez, Fleck, Kopeikin, Lewis, & Lyon, 1993; Bugental & Lewis, 1998; 1999; Bugental, Lewis, Lin, Lyon, & Kopeikin, 1999; Lewis, Bugental, & Fleck, 1991). Thus in some cases, children differed naturally in their characteristics (e.g., “difficult” or “easy” in their temperament style). In other instances, children served as experimental confederates and enacted the role of a “difficult” or “easy” child. In still other instances, the behavior of the child involved a fully-controlled computer simulation of a child’s behavior. The outcome variables in these studies focused on adults’ communication patterns (both verbal and nonverbal), affective responses, and cognitive processing.

The central findings obtained were replicated across studies. The most negative and most ambivalent reactions were shown by adults with low perceived power -- paired with a “difficult” child. Within such pairings, adults with low perceived power were more likely to show a communication pattern that revealed both their control efforts and their perceived lack of control.
Their facial affect often revealed a high presence of “non-Duchenne” smiles (Bugental, Kopeikin, & Lazowski, 1991; Bugental et al., 1996), that is, smiles of a type shown when people are motivated to appear pleasant but do not actually experience positive affect. In addition, their vocal patterns often showed high levels of uncertainty (e.g., non-fluencies in speech, low vocal amplitude), combined with assertive verbal content (Bugental & Lewis, 1998, 1999). Adults with low perceived power (in comparison with those with higher levels of perceived power) often showed opposite patterns in different contexts.

In terms of their behaviors, caregivers with low perceived power – after being primed for competitive ideation – have been observed to manifest a harsher interaction style. In particular, fathers with low perceived power – primed for thoughts of competition – were more likely (than other groupings of fathers) to verbally derogate the performance either of their own child or that of an unrelated child (Bugental & Happaney, 2000). In addition, women who believed they were interacting with a child over whom they had low control (actually a computer simulation) subsequently showed more punitive responses when given the opportunity to give feedback to the “child” at the end of the “training” session (Bugental, Lewis, Lin, Lyon, & Kopeikin, 1999).

In summary, adults with low perceived power when experimentally paired with or primed for interaction with a “difficult” child show a variety of responses that reflect a defensive response pattern in terms of their communication and their behavior. This set of investigations gave a strong focus to the role of cognitions within transactional relationships. In addition, we found that the effects observed in caregiver interactions could only be accounted for by the interaction between adult beliefs and children’s characteristics. Indeed no significant main effects were found for either caregivers’ beliefs or child characteristics.

**Biological Mediators of the Relationship between Parental Cognitions and Behavior**
As support emerged for the cognitive factors that foster maladaptive and hostile responses, other questions arose. In particular, it became important to determine the mediating variables. Did harsh parenting follow simply from biased information-processing, or did those biases lead to some kind of physiological response that more directly accounted for parental reactions? Parental responses typically appeared to be “defensive” in nature -- as if these individuals were protecting themselves against a threat. Was it possible that physiological threat responses systems were exceptionally easily activated among individuals who themselves might be thought of as “threat-sensitive”? And was their targeting of children whose response characteristics were ambiguous a significant factor? Relevant to this question, it should be noted that some biological response systems are activated in stressful situations in which there “might” be a threat, and preparatory processes are engaged for this eventuality (as described by McEwen, 2002). Possibly parents who are threat-sensitive are more likely to be continuously vigilant for potential threat within caregiving relationships.

Over time, increasing advantages have been found for the inclusion of biological factors within social relationships. Consideration of transactional processes in families has broadened to include these variables. For example, developmental neuroscience has provided guidance with respect to some of the physiological processes that serve to mediate transactions in parenting relationships (e.g., Bugental, Olster, & Martorell, 2002). Cognitions influence behaviors not only as a function of selective information-processing, but also through mediating processes that occur at the level of the central nervous system (e.g., threat-related hormonal changes).

As anticipated, threat-oriented adults -- when paired with a difficult child -- showed high activation of physiological stress response systems. For example, they showed increases in cortisol levels (Lin et al., 2002), and increases in heart rate (Bugental et al., 1993; 1999; Lin et
In addition (and unlike other adults), they failed to habituate (in terms of heart rate) when repeatedly exposed to the same stimulus children (Bugental, Olster, & Martorell, 2002). In other research, they were also found to show increases in electrodermal activity (Bugental et al., 1993; Bugental & Cortez, 1988) as well as decreases in (finger) skin temperature (Bugental & Cortez, 1988). This general pattern is consistent with the physiological reactions expected to be shown in response to perceived threat. The observed increases in heart rate were also found to serve as a partial mediator of the punitive responses shown to (computer–simulated) children (Bugental, Lewis, Lin & Kopeikin, 1999; Bugental, Olster, & Martorell, 2002).

In similar fashion, mothers with their own infants have been found to show increasing physiological activation as a function of their biased perceptions and the difficult nature of their child’s temperament (Martorell & Bugental, 2006). Mothers with low perceived power were found to be more likely to show increased cortisol levels in response to a stressful interaction when their children also revealed a difficult temperament pattern. This response pattern, in turn, was found to mediate the mother’s greater use of harsh parenting practices.

**Child Reactions to the Response Style of Threat-Sensitive Caregivers**

Bringing the process back full circle (within a transactional framework), measures were taken of the reactions of children to the response style of adults with high or low perceived power (Bugental, Lyon, Lin, McGrath, & Bimbela, 1999). In two different studies, children believed they were receiving training on a task from an unrelated adult (whom they saw on videotape). The measures of primary interest were their orienting responses while watching the adult and their subsequent performance on a cognitively demanding task (mental arithmetic). In the first study, the tapes employed were those made of previous research participants when they believed they were training a child. In the second study, the tapes employed involved an actress
who enacted the nonverbal responses found to be typical of women with low perceived power (when paired with difficult children) – versus the nonverbal responses more typically shown by other women. In both cases, the communication style of the “low power” teacher was ambiguous (e.g., non-Duchenne smiles and uncertain voices, combined with relatively assertive verbal content). Children responded in significantly different ways to the two communication patterns. That is, they were more likely to orient to the non-ambiguous teacher (e.g., showing reduced heart rate) than to the ambiguous teacher. Following their interaction with an ambiguous teacher, children showed greater performance deficits on a cognitively-demanding task. These findings suggest that the response pattern more common for adults with low perceived power ultimately feeds back to decrease the attention and performance levels of such children – thus increasing the extent to which they could be seen as “difficult.” In a second study (Bugental & Happaney, 2000), we observed that children exposed to the “derogating” speech of a threat-sensitive adult (either a parent or non-parent) were more likely to withdraw from that interaction.

It appears that children are more likely to withdraw or disengage from the response style of a threat-sensitive adult. Thus the response style of threat-sensitive adults tends to elicit responses from children that ultimately serve to confirm the expectations of those adults.

Longitudinal Research in Families

Although the experimental program described allowed the possibility of drawing causal inferences – and thus providing support for the proposed model in terms of internal validity – it lacked external validity. Still needed was evidence that equivalent processes are actually found in families that are at risk for child mis- or maltreatment. What was needed was a longitudinal study that tracked the transactional processes that emerged during infancy. A full test of the model required the assessment of parental attributions before the child was born – thus allowing
a test of the extent to which initial adult attributions serve to differentially moderate their reactions to children who might be interpreted as presenting a caregiving threat or challenge at birth (versus children who posed no such threat).

A short-term longitudinal study was conducted (Bugental & Happaney, 2004) of families identified as at risk for maltreatment (due to the background of these parents). Thirty-one per cent of the children within these families were born at some level of medical risk; that is, they were born prematurely or had relatively low (5-min) Apgar scores. Prior to the birth of children, mothers completed the Parent Attribution Test. The primary outcome measure was the mother’s use of harsh parenting during the first year of life. At the end of the year, mothers completed the Conflict Tactics Scale (Straus, 1979), a commonly-used measure of child maltreatment. In addition, mothers completed the Beck Depression Inventory.

The combination of child medical risk at birth (primarily preterm status) and the mother’s pre-birth attributions served as a significant predictor of (1) maternal depression, (2) maternal use of harsh practices (primarily spanking or slapping), and (3) maternal neglect in maintaining child safety. No significant differences or trends were found as a result of maternal parity. Thus it appears that maternal attributions were predictors rather than reflections of their history with a particular child. Maternal depression, in turn, partially mediated the observed relation between predictor variables and harsh parenting.

Response of Infants to Their Parenting History

Further research was conducted to determine the reactions of infants to the responses found to be characteristic of threat-sensitive mothers interacting with infants who experienced birth complications. As toddlers, children were placed in a fear-inducing situation (the Strange Situation), and their cortisol levels were measured (both at baseline and in reaction to separation
from their mothers). The highest level of cortisol reactivity was shown by infants whose mothers had demonstrated harsh tactics during their first year of life (Bugental, Martorell, & Barraza, 2003). In addition, children manifested variations in their basal levels of cortisol as a function of maternal depression. Basal levels were twice as high among children of mothers who manifested depressive symptoms.

Ultimately, the hormonal responses shown by children have important implications for their later outcomes. Over-activation of the HPA axis (either as a function of excess basal levels of cortisol, or high cortisol reactivity) predicts a number of later negative outcomes, for example, deficits in memory, affective and behavioral problems, immune system dampening and health problems, interference with growth and reproduction, and high reactivity/low habituation to stress or novelty (Bremner & Narayan, 1998; Sapolsky, 1996). Any one of these outcomes also serves to heighten the challenge that such children pose for their parents.

**Maltreatment Prevention in High Risk Families**

One of the strongest possible tests of a transactional model is the extent to which it can be useful in designing a program that effectively prevents the psychopathology-amplifying effects that follow when mothers with threat-focused explanatory biases are paired with children who pose a potential threat or challenge to their caregiving ability and maintenance of authority. In order to provide such a test, an intervention was designed that was partially modeled after existing home visitation programs extended at birth to at-risk families. However, the central features of the program were specifically designed to allow cognitive reframing of the challenges presented by “difficult” infants (Bugental, Ellerson, Lin, Rainey, Kokotovic, & O’Hara, 2002).

Rather than creating an entirely new program, new features were added to the basic Healthy Start Model originally introduced in Hawaii (Breakey & Pratt, 1991; Duggan,
Families were referred by local hospitals and health care agencies on the basis of traditional risk factors, for example, poverty, stress, absence of social support, low education, and maternal history of having been abused herself. Families accepted to the program scored as being at moderate risk on the Family Stress Checklist (Murphy, Orkow & Nikola, 1985). Families were randomly assigned to one of three different conditions:

1. Group C: A control condition in which parents were given information concerning existing services available to them in the community (but no provision of direct services was offered).

2. Group B: The second condition essentially employed the Healthy Start Model – and focused on traditional parent education, provision of social support, and assisting the formation of linkages with others in the community.

3. Group A: The third condition included the features offered in Groups B and C but in a way that focused on cognitive reframing. That is, instead of offering solutions, information or guidance, mothers were assisted in learning how to become effective information-seekers and problem-solvers.

As the third intervention condition is novel, it may be useful to hear more details on the method employed. At each visit, mothers were asked to describe how things had been going with the infant since the last visit, including any problems or concerns. When the mother identified a problem, she was then asked what she thought was the cause. If the mother identified a cause that involved blame (of self or others), she was encouraged to think of other possible causes. When a cause was considered that was not blame-oriented, she was then asked to think about possible resolutions she could try. In the consideration of possible causes and resolutions,
mothers were always encouraged to think about how one knows what an infant is experiencing – in view of the fact that they can’t tell you. This procedure served to facilitate the mother’s own problem-solving, and no direct advice or information was offered. For example, mothers might be encouraged to locate the books and videotapes the state (California) had provided them; the home visitor and mother then explored together what was known about the problem identified by the mother (along with some of the possible solutions offered).

As a specific example, one mother thought her infant was “talking back” to her at 3 months of age – reflecting the commonly observed process in which infants babble in response to hearing their mother talk. The mother, however, had interpreted the infant’s behavior as an early warning of later problems. By exploring the possible explanations of this “problem,” she was able to re-construe the meaning of the event. She was also able to observe that the infant, in doing this, was also showing happy affect.

Families in groups A and B received the same number of home visits across the first year of the child’s life. Significantly greater effects were found in the A than in the B or C conditions. The lowest levels of abuse (4%) were found in the A-condition (in comparison with 23% in the B-condition and 26% in the C-condition). Similar advantages were found in reductions in maternal use of non-abusive but harsh tactics (e.g., spanking), or in the reports of child injuries (a factors that may either reflect neglect or that may serve as a subtle marker of unreported abuse).

In addition, lower levels of maternal depression (at the end of a year) were found in the A-condition than in the B or C conditions. Reductions in maternal depression were found to serve as a mediator of the observed reductions in harsh parenting tactics found in the cognitive reframing condition.
A replication of the cognitive reframing program was conducted that included an assessment of maternal practices (Bugental & Schwartz, in press). A comparison was again offered between the A condition and the B condition. Referral of families to the program, rather than being based on the parent’s history, was now based on the child’s medical history. Families were included in which infants had experienced some type of medical problems at birth (conditions that predict elevated risk for abuse, Brown, Cohen, Johnson, & Salzinger, 1999; Sherrod, O’Connor, Vietze, & Altemeier, 1984).

Previous findings were replicated in terms of the advantage of the cognitive reframing condition for reducing harsh parenting practices. Mothers in the A condition were less likely to use harsh parenting practices than did mothers in the B condition. Consistent with this pattern, fewer injuries were reported (during the first year of life) for infants in the A condition than the B condition.

**Differential Reactivity of Children to Social Context**

At some point within this program of research, it became apparent that not all children were equally reactive to their social context. As suggested by Boyce and Ellis (2005), children differ in their reactivity to social context. For example, the stressful nature of a child’s early experiences may foster elevated levels of reactivity. Belsky and his colleagues (Belsky, 2005; Belsky, Hsiah, & Crnic, 1998) -- as well as Boyce and Ellis (2005) -- have also suggested that children differ in their sensitivity to their parenting history based on their temperament patterns. Differential reactivity of the young to their early experiences is not limited to humans, however; variations in the reactivity of the young to maternal care have also been observed among non-humans (e.g., Liu, Diorio, Day, Francis, & Meaney, 2000).
In two studies within our own program of research, children with more severe problems at birth were found to manifest both the most and the least adaptive hormonal responses, based on their social environment. In a retrospective study (Bugental, Beaulieu, O’Brien, Schwartz, Cayan, Fowler, & Ellerson in press), young adults who had experienced early medical problems were found to respond differentially to later stressors, based on their ongoing level of social support. Young adults who experienced early medical problems but currently had a high level of social support were more likely to show higher levels of habituation (reduced cortisol reactivity to a stressor when it was repeated) than did others, including those who lacked any history of medical problems and who currently had high social support.

In prospective research (Bugental, Beaulieu, & Schwartz, 2007), infants who were born prematurely were shown to be more reactive to maternal depression than were full-term infants. That is, the highest levels of basal cortisol were shown by preterm children in response to maternal depression. At the same time, the very lowest levels of basal cortisol were shown by preterm children in response to non-depressed mothers.

Integration

The model we have tested with respect to parenting processes in high risk families began with an emphasis on the role of parental cognitions as moderators of the differential responses shown to “difficult” children. Our early research demonstrated that the transactional processes involved were reciprocal in nature. The kinds of responses shown by threat-oriented parents to “difficult” children fed back to increase the likelihood that such children would continue (or escalate) in the potential threat they offered to vulnerable parents. In addition, pathology-amplification or attenuation in families depends not only on the differential sensitivity of parents to caregiving threat but also on the differential sensitivity of children to their social context. The
processes observed are consistently reflected in interactions rather than main effects. In pathology-amplifying situations, the combination of a threat-sensitive parent and a context-sensitive child combine to create a negative transactional system. In contrast, a pathology-attenuating situation is fostered with the combination of (1) a parent who sees anomalous caregiving situations as challenges rather than threats, and (2) a context-sensitive child. Context-sensitivity in children leads to heightened reactivity to positive contexts (with resultant pathology-attenuation) as well as heightened reactivity to negative contexts (with resultant pathology-amplification).

Extending this model (as a bio-cognitive transactional model), we went on to demonstrate relevant mediating processes at a physiological level. That is, when parents were confronted with ambiguous threat (as a result of the characteristics of the child and their own explanatory biases), they were more likely to manifest threat-consistent physiological responses (e.g., increases in heart rate and cortisol production). These changes in turn were found to mediate the harsh responses shown by such parents. Parental harshness (in particular, when combined with depression) fostered increases in the stress responses of infants – in particular among children at greatest risk (i.e., premature children). Thus the inclusion of measures and concepts from developmental neuroscience may aid in explaining transactional processes in families.

As a future direction, we are exploring the transactional processes that occur in the reciprocal effects of biology and life experience. These two approaches -- previously seen as opposed -- are increasingly being understood in an integrated fashion.

One biological view (an evolutionary approach) focuses on the extent to which the young (and their parents) are designed for adaptive responses to problems that have recurred across a species’ evolutionary history. For example, environments vary over time in the resources
available for care of the young. Parental investment (among both humans and non-humans) in “costly” infants (e.g., those born with cues to health risk) is relatively low when parents lack resources (material or social). On the other hand, parental investment in “costly” infants may be exceptionally high when those parents have high access to resources -- and thus can “afford” the added investment in the costly offspring without putting siblings in peril. This position was suggested by Mann (1992), and was subsequently amplified and empirically demonstrated by Bugental and Beaulieu (Beaulieu & Bugental, in press; Beaulieu & Bugental, 2006; Bugental & Beaulieu, 2003).

The second view focuses on the extent there is change in the young (at the level of brain and behavior -- as mediated by differential gene expression) in response to the nature of the young’s early environment (Liu, Diorio, Day, Francis, & Meaney, 2000). If the young experience high stress -- without maternal responses that reduce that stress -- they show gene expression that fosters fearfulness. However, if the young experience maternal responses that reduce their stress (for rat pups, this involves licking and grooming, and arched-back nursing) -- they show more adaptive gene expression (and behavior) at later ages. As a result of this second transactional system, the young accommodate within their lifetime to the actualities of the environment to which they are born.

The two approaches are now understood as working well together as an adaptive transactional process. As biological models are receiving greater attention within the study of parenting relationships, increasing recognition is being given to the fact that the brain is both “experience-dependent” (as demonstrated in work on differential gene expression) and “experience-expectant” (as promoted by an evolutionary framework) -- an integrative framework suggested by Bruer & Greenough (2001). Consideration of these fully compatible and
interwoven processes extends the notions of transactions in parental relationships in a new and highly productive direction. The combined transactional processes are not only important from a theoretical standpoint, they also provide guidance in the design of remedial programs that foster pathology attenuation within at-risk family systems.

In conclusion, the transactional framework originally proposed by Sameroff has proven to be flexible in allowing the incorporation of ideas drawn from a variety of theoretical perspectives, as well as the full range of variables thought to operate within families. It has also provided a valuable way of understanding the processes that operate in pathology-attenuating as well as pathology-amplifying family systems.
References


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Bio-Cognitive Transactional Model of Child Maltreatment

If "threat-based" parental perception

"Difficult" child (e.g., poor emotion regulation)

Child avoidance; attention withdrawal

If "benign" parental perception

Reduced child "difficulty"

Increased child attention

Negative affect; threat-consistent physiological responses

Dysregulation of stress response system

Positive affect

Defensive (& unpredictable) parental responses, vacillation between aggression & appeasement

Parental engagement